Technical weave
for clean water

Woven metal mesh and filter solutions

Expertise

Mesh solutions from the **technological leader**

GKD: **Made-to-measure innovations**

GKD is the global technological leader for cutting edge industrial weave and filtration solutions produced from both metal and synthetic wires, as well as technical fibers – for all industrial applications. With innovative weaving technologies and the latest material simulation methods, we create efficient technical weaves, semi-finished products, components, and filter equipment – optimally matched to the most diverse mechanical process engineering requirements. GKD manufactures technical weave solutions for a wide range of applications in the field of water processing.

GKD brings considerable expertise in support of transforming industry for sustainability goals. Our customers benefit from tailor-made solutions, hands-on consulting, and worldwide service partnerships. GKD continuously develops new fields of application through manufacturing technology and process expertise. We use GKD mesh to create efficient systems, equipment, and components that are perfectly integrated into our customers' processes across all industrial sectors. Thanks to ISO certifications, our customers can rely on certified quality worldwide.

Clean water **for a healthy environment**

Water is one of the most important building blocks for life on Earth, yet is available only in a limited quantity. It is therefore essential to handle and use it carefully. GKD high-performance meshes are used in a wide range of cleaning and filtration processes, where they ensure that water can be reused, is healthy for consumption, protects the technology used in the household, is free of micro-plastics or does not even get contaminated in the first place. Our strengths include the reliable reproducibility of our products, many of which are patented, and our high methodological expertise for multi-faceted areas of application.

Whether process, ballast and drinking water or sewage sludge: GKD filtration meshes and elements can be found in a very wide range of process stages and applications in the fields of filtration, screening, and separation. They deliver key benefits for customers from industry and local authorities – in terms of the efficiency of systems, the effectiveness of processes, and the safety of health-related products.

Besides manufacturing filtration meshes, elements and inserts, as well as process belts, we also re-screen existing filters with new filtration meshes within the scope of repair orders. This is not only cost and benefit-oriented, but also makes an important contribution to environmentally conscious handling of resources.

The areas of expertise held by GKD for a very wide range of segments in the field of water processing help customers across the globe achieve greater cost-effectiveness in their processes, as well as the best possible work results – making our world healthier, cleaner, and safer.

Solutions

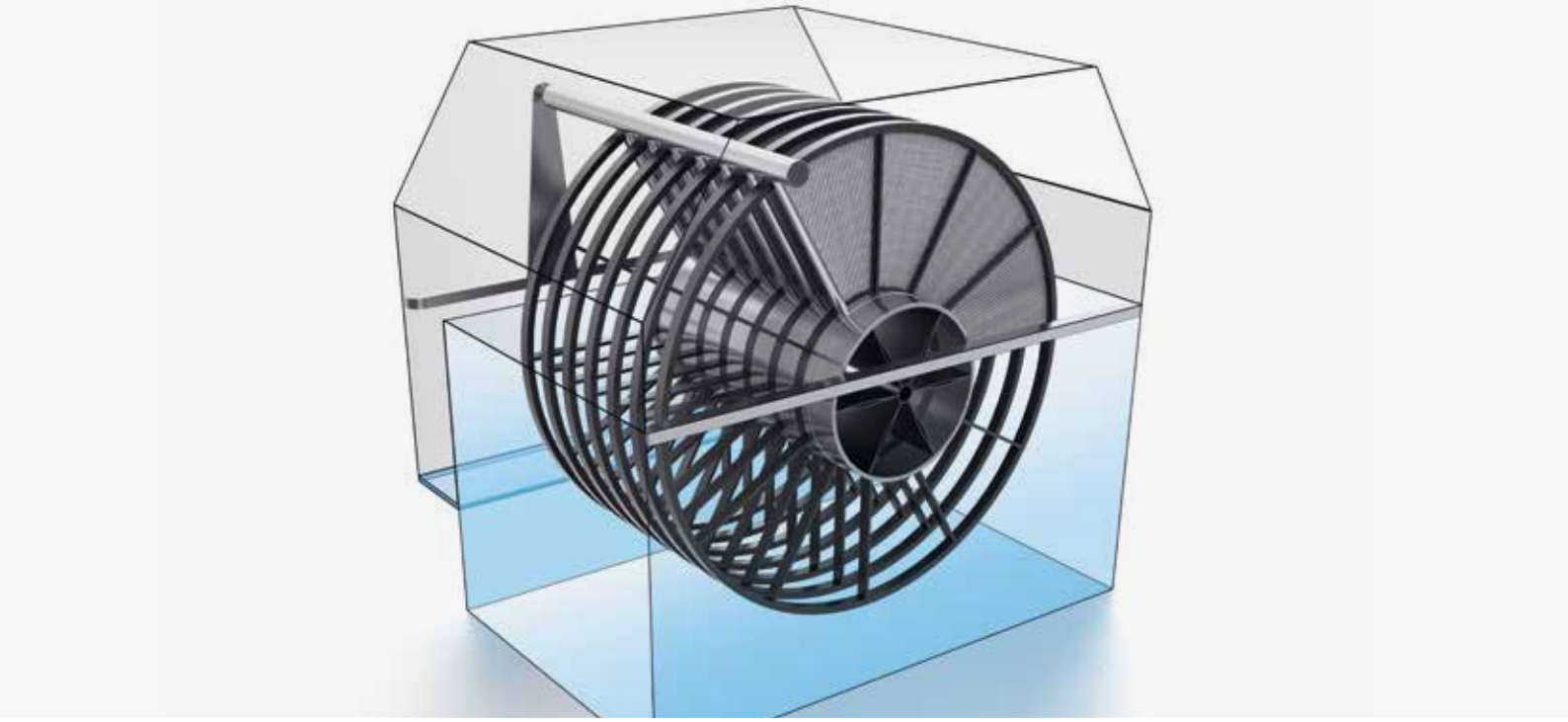
Industry and local authorities

Drum and disk filters for **micro sieving**

Screen and filtration meshes from GKD are used in many areas of mechanical micro filtration of wastewater, including wastewater treatment in industrial environments and at local authorities.

Drum or disk filters are, for example, used for filtration applications in municipal wastewater treatment. Adding corresponding downstream treatment stages can then significantly improve the effluent quality of both biologically treated wastewater and untreated wastewater. Filtration of biologically treated wastewater is used to remove particulate material that remains suspended in the outlet stream.

Our meshes for micro sieving are also used for treating raw wastewater that is discharged into seas and large rivers. They allow almost all particulate material to be removed.



River water treatment for industry is another application area for our filter media and the accompanying drum and disk filters. The water is required as process water for a wide range of applications in industry, including cooling and much more. Surface water is pumped directly from the river for treatment. Once coarse materials have been removed in the first step, the water is fed through rakes and fine screens. It then makes its way into the filter system. In the individual filter segments, GKD micro sieving mesh retains the filterable particulate.

Benefits of micro sieving

- Optimized dutch weave with precise filtration rate
- Matching screening and filter segments
- Separation rates starting from 6 µm
- High flow rates
- Good regenerability in the filter

Solutions

Industry and local authorities

Process belts for **sludge treatment**

Whether for industrial sludge, product and chemical sludge, or sludge at municipal sewage plants – process belts from GKD dewater reliably and effectively. The combination of the right synthetic monofilament, matching weave type, and aperture makes our meshes particularly rugged and capable of handling both chemical influences and abrasion. Since they are manufactured on heavy-duty looms for metal fabric and hardened using the thermal fixing process, they also display excellent mechanical stability. This ensures the best belt running properties, thereby making a key contribution to fault-free operation.

Belt presses and belt dryers significantly reduce the sludge volume, which in turn lowers both transport and disposal costs for efficient and environmentally-friendly reprocessing.

Thanks to longstanding relationships with leading manufacturers, we know what really matters when it comes to pressing, drainage, and dryer belts.

For individual requirements

With our wide range of both standard and custom products, we offer customers the ideal solution for dewatering all types of sewage sludge. We manufacture laterally stable belts from polyester (PES), polyamide (PA), or polyphenylene sulfide (PPS) with widths of up to eight meters. These belts are suitable for any requirement and also available with a wide range of seams. Thanks to its low thickness, the PAD seam developed by GKD guarantees better belt running characteristics and a longer service life. Sales and technical experts are also on hand to offer advice and support for individual solutions.

Lower costs, greater efficiency
Sludge drying plants reduce the weight and volume of sludge, while increasing the dry-matter content to up to 98 percent. Using GKD process belts produced from polyester (PES) or polyphenylene sulfide (PPS), drying plants achieve optimum residual moisture reduction. This reduces energy consumption and disposal costs, which in turn increases efficiency. Our synthetic fabric belts can handle a wide range of deployments and are suitable for dryers with conventional belt control or forced guidance systems.

Thanks to their combination of rugged synthetic monofilaments, elaborate refinement, and the PAD seam developed by GKD, the belts can handle particularly high surface loads. The unique mesh structure on their underside makes the belts easy to clean using just a small amount of water and therefore environmentally friendly.

Benefits of GKD process belts

- High degree of transverse stability and mechanical strength
- Optimum throughput rate
- Easy cleaning
- Extremely high temperature resistance
- Chemical resistance
- Matched to the process and individually manufactured

Solutions

Aquaculture and agriculture

Filter elements for **fish farming** and irrigation systems for **agriculture**

Land-based aquacultures are becoming increasingly important as a way of meeting the need for plants and animals that live in water. Fish, seafood, and shrimps are all farmed in large tanks. However, the water in the tanks gets soiled by food and excretions, so it requires filtration.

GKD offers the ideal filtration mesh and elements for precisely these filtration applications in recirculating aquaculture systems (RAS). In installations of this kind, the water quality is subject to continuous testing. Regular cleaning and treatment then allow it to be reused. Drum and disk filters are used to filter out fish excretions and any remaining food. GKD provides the high-performance Porometric mesh for this.

Best cleaning characteristics

Its three-dimensional slit structure boasts almost 90 percent porosity and achieves an unmatched flow rate, which can significantly increase throughput with the same pump output. Thanks to the high dirt-holding capacity, Porometric also requires fewer cleaning cycles, despite the greater filter performance. In independent comparison tests performed by the Karlsruhe Institute of Technology (KIT), the rugged and highly efficient stainless steel mesh demonstrated the best cleaning performance – while also exhibiting a lower backwashing rate.

The major benefit: Since Porometric is woven from metal and not plastic, no microplastics can make their way into the ecosystem – a win in terms of quality, health, and the environment.

Extended maintenance intervals

Filter equipment used for irrigation of agricultural products represents another application area of GKD filtration meshes and elements. Both organic and inorganic particulate can clog irrigation sprayers. This can severely compromise the performance of an irrigation system, increase maintenance costs, and in the worst case negatively impact harvests. Filtration meshes and elements from GKD can extend maintenance intervals and help systems deliver greater performance and efficiency.

Benefits of Porometric

- Increased permeability
- Reduction of highest, local pore velocity
- Good backwashing properties
- High porosity
- High dirt-holding capacity

Solutions

Ballast water treatment

Filter cartridges and elements for **ship's water treatment**

In on-board treatment systems, seawater is filtered during intake and, where necessary, also before release. After all, ballast water is not just a technical necessity for ship-owners, but also a major responsibility. If the water is not rigorously cleaned, organisms can find their way into foreign waters.

Filter media produced from stainless steel represent the mechanical basis for reliable filtration of the ballast water. Our optimized dutch weave (ODW) and PZ Mikrodur mesh (PZ) are also used here. Thanks to their good filtration properties, the filters with our filter media are able to achieve a particularly good dirt-holding capacity, while also being easy to clean. This offers both a longer service life of the systems and exemplary ease of use.

High quality for reliable filtration

We continuously adapt the design of our filter cartridges and filter disks for individual ballast water treatment systems according to the available technology and the required performance profile. This also includes selecting the optimal stainless steel quality.

The minimum requirements for ballast water treatment systems are regulated by the IMO Ballast Water Management Convention. This stipulates

Benefits of GKD filtration mesh

- Good regenerability and dirt-holding capacity
- High permeability
- High mechanical load-bearing capacity

precise filtration limits of between 10 and 50 µm. Ships calling at ports in the US must also satisfy the stricter requirements of the US Coast Guard. Both regulations can be reliably met with GKD filters.

Solutions

Private households

Ultrafine filtration for household appliances and fittings

Filtration solutions with GKD mesh can be found in a wide range of areas in any household, among other things for protection from microplastics. Because once tiny plastic particles have entered the ecosystem, they can potentially come directly out of the faucet.

Water filters with fabric pores that are four times smaller than a human hair are suitable for protecting both humans and animals from these hazards. Not only do these retain microplastics, but also metal particles, solids, and sediment. This results in reliably clean water directly from the faucet, as well as reduced microplastics in the environment.

In addition to this, pipes, lines, and devices need to be protected from grains of sand or rust particles that find their way into household drinking water. These can damage installations and cause pitting or corrosion. Back flush filters are used here, and GKD provides filtration solutions produced from stainless steel for this, such as an optimized dutch weave.

Benefits

- Reduction of microplastics, metal particles, sediment, and solids
- Improved drinking water quality
- Protection from pitting and corrosion
- Reduced wear

Solutions

Analysis of microplastics

Patented microfilter crucible: Fast, secure, and efficient analysis

To allow the potential risks associated with microplastics for both humans and the environment to be reliably assessed, a uniform sampling and analysis methodology is required. After all, valid results can only be produced with standardized and routine processes.

Together with the German Federal Institute for Materials Research and Testing (BAM) and the German Federal Environment Agency (UBA), GKD developed a microfilter crucible produced from stainless steel that is used in a TED-GC/MS system of Gerstel GmbH. This facilitates fast and reliable routine analyses for determining the mass content of microplastics in environmental media, even when processing complex samples. The patented microfilter crucible can be used directly for filtration of sample media or flotates. Additional work steps, such as risky decanting and freeze-drying, are then no longer required, the risk of particle loss is minimized, and contamination with plastic particulate is prevented.

Sophisticated and proven solution

Optimized dutch weave from GKD with a geometric pore size of five micrometers is welded onto the base of the ten-millimeter-high container as the filter medium. This rugged, single-ply stainless steel mesh guarantees secure retention of all particles above the separating limit of five micrometers, while also facilitating an unusually high flow rate.

This grants industry, research, and authorities access to a sophisticated solution for performing routine analyses. The system has already proven its value, particularly for quality control of water-based beverages, as well as in the field of microplastic analytics for mineral water in PET bottles.

Benefits of the microfilter crucible

- High selectivity
- Precise determination of mass content
- Secure retention of all particles
- Time and cost savings
- Temperature resistance up to 600°C

Solutions

Trends for the future

Concepts for future challenges

Many companies are currently working on solutions for washing machines, for which they are also testing meshes from GKD. During each wash cycle, up to 700,000 microplastic fibers are released from our laundry, which is largely produced from synthetic fabrics. These fibers then find their way into the wastewater and thereby our ecosystem. The filtration solutions equipped with GKD meshes reliably retain the microplastics and thereby clean the wastewater.

Filtration mesh for **urban water management**

Private transport also places a microplastics burden on our environment. This is largely due to tire abrasion that is channeled into the sewer system via storm drains and can then find its way into rivers, lakes, and seas.

The TU Berlin is researching an innovative multi-stage filter system that retains microplastic particles down to a size of three millimeters, as well as other particulate and pollutants. In addition, the various filter models used in urban filters for roads, manholes and runoff also retain cigarette butts, dog feces, and leaves.

GKD is supporting this research project with mesh solutions that are required in the filter baskets of manholes, as well as for fine filtration. Initial test results confirm the effectiveness of the urban filter. During the further course of the project, the filter system is set to be continuously improved, with monitoring and cleaning intervals being extended accordingly.

Production

Manufacture: **Highest standards**

Manufacturing: **From weaving to finishing**

Weaving, cutting, cleaning, rolling, punching, finishing, and much more. With the latest looms and manufacturing equipment, GKD produces the full range of industrial meshes and systems made from metal, synthetics, and technical fibers. Always leading with the individual requirements of customers in mind. Step by step, we analyze the demands on the material and the type of application, and we also optimize processes and services. This eye for detail, many years of development excellence and process expertise as well as our consistent cost-benefit orientation are what make GKD a sought-after partner around the world.

What's more, products from GKD are produced to the highest standards – all the way up to production for clean room standards.

Our services

- Process and requirements analyses with material simulation tools (GeoDict/OpenFOAM)
- Consultation on the choice of material
- Application optimization and customized component design
- Continuous analysis and further development
- The latest manufacturing methods and leading production standards
- Certified know-how and decades of expertise

Our guarantee:
Proven quality

GKD doesn't just excel at production – we also have our own laboratory where we thoroughly inspect all of our meshes and associated components. It's vital that quality products from GKD precisely meet the customer's desired specifications. That's why our physical and technical laboratory conducts tests in the following areas:

- Product development
- First sample inspection
- Inspection in the event of damage
- Inspection in the event of a complaint
- Customer-specific tests
- Production-related quality assurance

The benefit of the customer is at the heart of all testing scenarios. Our staff members possess the best material and testing expertise, work with the latest laboratory technology, and network constantly with professionals from the fields of inspection technology and science. The laboratory experts supervise the entire lifecycle of GKD products.

Inspection procedures (selection)

- Mechanical and physical testing
- Chemical testing
- Quality-assurance mesh testing

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